✅ Case Study Title: Citizen and Passport Management System

Business Context:

A national government agency maintains records of citizens and the passports issued to them. The rule of the system is:

• Each citizen can hold exactly one passport

• Each passport must be assigned to only one citizen

This kind of relationship is a textbook example of a One-to-One association, where one record in the Citizen table corresponds to one record in the Passport table, and vice versa.

CitizenPassportHibernate/pom.xml:

```
<project xmlns="http://maven.apache.org/POM/4.0.0"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://maven.apache.org/POM/4.0.0
http://maven.apache.org/xsd/maven-4.0.0.xsd">
<modelVersion>4.0.0</modelVersion>
 <groupId>com.example</groupId>
 <artifactId>CitizenPassportHibernate</artifactId>
 <version>0.0.1-SNAPSHOT</version>
  <properties>
  <maven.compiler.source>17</maven.compiler.source>
  <maven.compiler.target>17</maven.compiler.target>
 </properties>
 <dependencies>
  <!-- Hibernate Core -->
<dependency>
    <groupId>org.hibernate.orm</groupId>
    <artifactId>hibernate-core</artifactId>
    <version>6.2.7.Final</version>
  </dependency>
    <!-- Jakarta Persistence API -->
  <dependency>
    <groupId>jakarta.persistence</groupId>
    <artifactId>jakarta.persistence-api</artifactId>
    <version>3.1.0</version>
  </dependency>

  <!-- MySQL Connector -->
  <dependency>
    <groupId>com.mysql</groupId>
    <artifactId>mysql-connector-j</artifactId>
    <version>8.0.33</version>
  </dependency>
```

```
</dependencies>
</project>
```

Citizen.java:

```
package com.example.entity;
import jakarta.persistence.*;
@Entity
public class Citizen {
   @Id
   @GeneratedValue(strategy = GenerationType.IDENTITY)
   private int id;
   private String name;
   @OneToOne(cascade = CascadeType.ALL)
   @JoinColumn(name = "passport_id")
   private Passport passport;
   public int getId() { return id; }
   public void setId(int id) { this.id = id; }
   public String getName() { return name; }
   public void setName(String name) { this.name = name; }
   public Passport getPassport() { return passport; }
   public void setPassport(Passport passport) { this.passport = passport; }
}
```

Passport.java:

```
package com.example.entity;
import jakarta.persistence.*;
@Entity
public class Passport {
   @Id
   @GeneratedValue(strategy = GenerationType.IDENTITY)
   private int id;
   private String passportNumber;
   @OneToOne(mappedBy = "passport")
   private Citizen citizen;
   public int getId() { return id; }
   public void setId(int id) { this.id = id; }
   public String getPassportNumber() { return passportNumber; }
   public void setPassportNumber(String passportNumber) {
this.passportNumber = passportNumber; }
   public Citizen getCitizen() { return citizen; }
   public void setCitizen(Citizen citizen) { this.citizen = citizen; }
}
```

hibernate.cfg.xml:

```
<?xml version="1.0" encoding="UTF-8"?>
<hibernate-configuration>
   <session-factory>
      <property
name="hibernate.connection.driver_class">com.mysql.cj.jdbc.Driver</prope
rty>
```

```
        <property
    name="hibernate.connection.url">jdbc:mysql://localhost:3306/passport_db
    </property>
        <property name="hibernate.connection.username">root</property>
        <property
    name="hibernate.connection.password">Guru@123</property>
        <property
    name="hibernate.dialect">org.hibernate.dialect.MySQLDialect</property>
        <property name="hibernate.hbm2ddl.auto">update</property>
        <property name="hibernate.show_sql">true</property>
        <mapping class="com.example.entity.Citizen"/>
        <mapping class="com.example.entity.Passport"/>
      </session-factory>
    </hibernate-configuration>
```

HibernateUtil.java:

```
    package com.example.util;
    import org.hibernate.SessionFactory;
    import org.hibernate.cfg.Configuration;
    public class HibernateUtil {
      private static final SessionFactory sessionFactory;
      static {
        try {
          sessionFactory = new
    Configuration().configure().buildSessionFactory();
        } catch (Throwable ex) {
          throw new ExceptionInInitializerError(ex);
        }
      }
      public static SessionFactory getSessionFactory() {
        return sessionFactory;
      }
    }
```

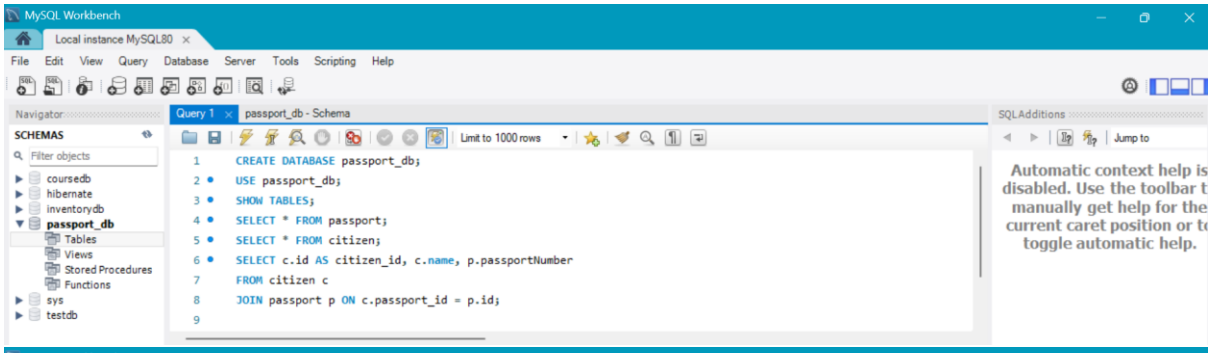
App.java:

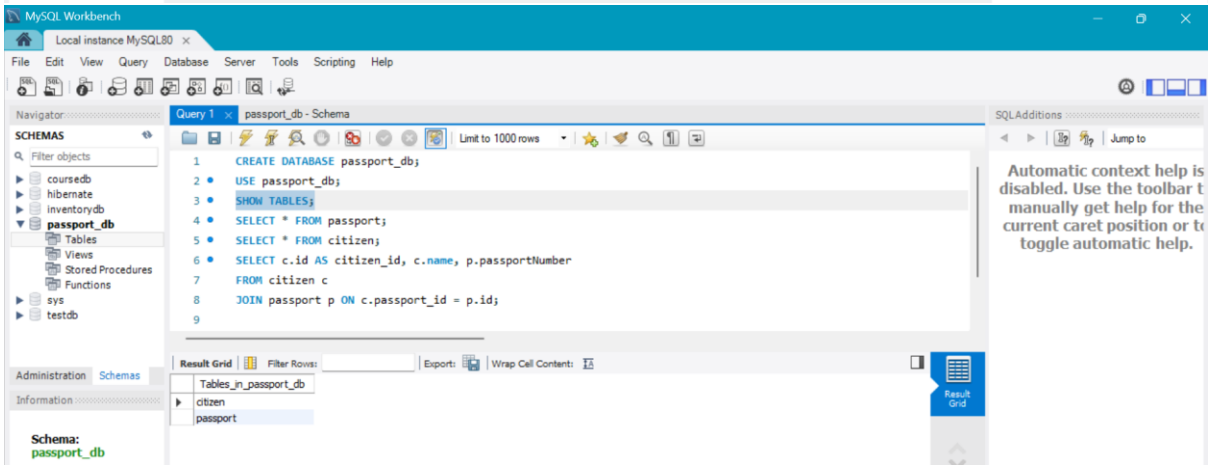
```
    package com.example.app;
    import org.hibernate.Session;
    import org.hibernate.Transaction;
    import com.example.entity.Citizen;
    import com.example.entity.Passport;
    import com.example.util.HibernateUtil;
    public class App {
      public static void main(String[] args) {
        Citizen citizen = new Citizen();
        citizen.setName("Viswath");
        Passport passport = new Passport();
        passport.setPassportNumber("IN123456");
        citizen.setPassport(passport);
        passport.setCitizen(citizen);
        Session session = HibernateUtil.getSessionFactory().openSession();
```

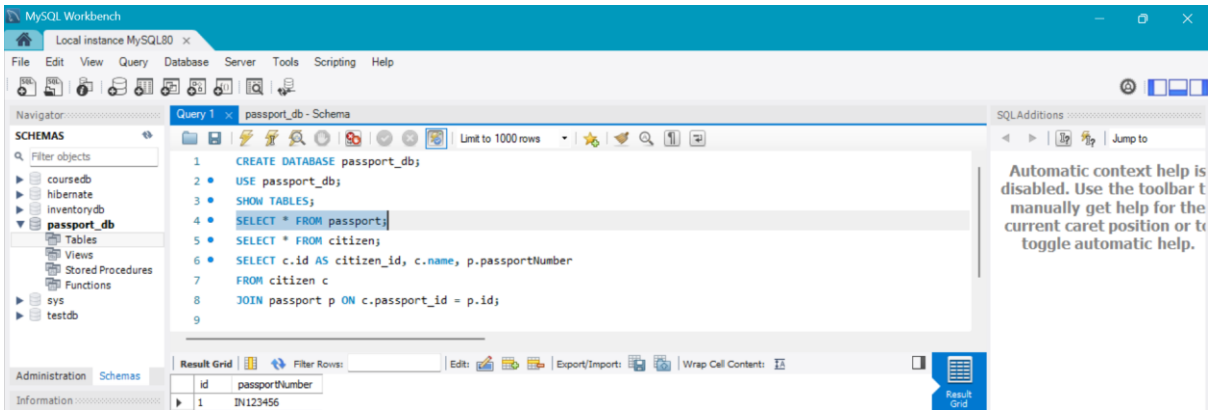
```
        Transaction tx = session.beginTransaction();
        session.persist(citizen);
        tx.commit();
        session.close();
        System.out.println("Citizen and Passport saved successfully.");
    }
}
```

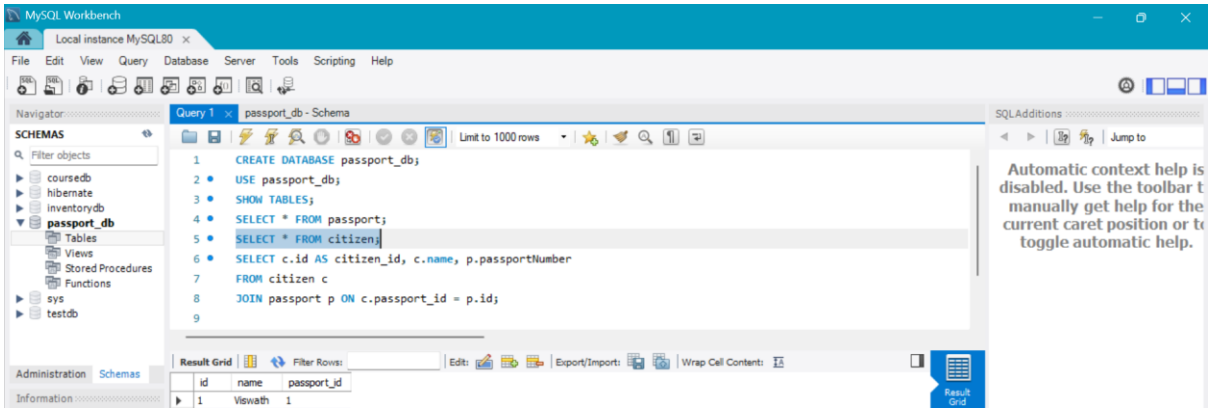
Output:

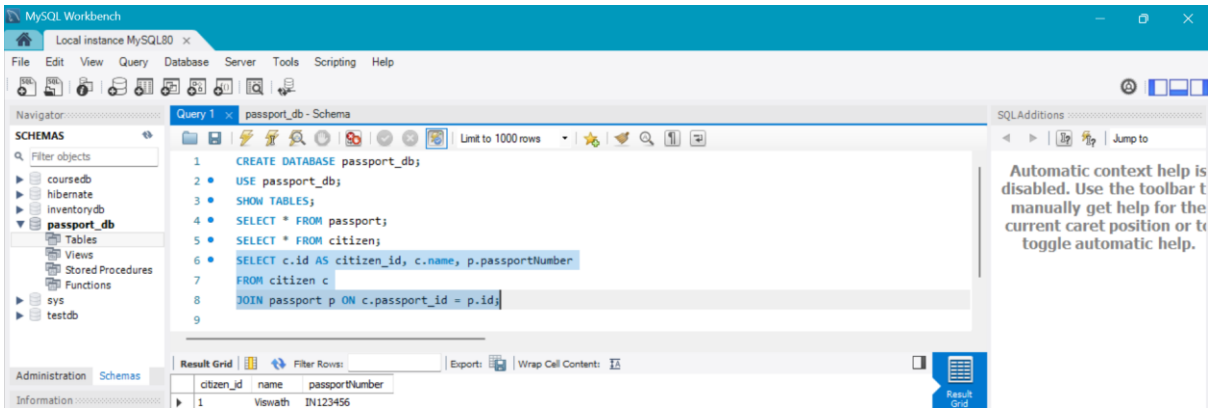
```
Hibernate: insert into Passport (passportNumber) values (?)
Hibernate: insert into Citizen (name,passport_id) values (?,?)
Citizen and Passport saved successfully.
```








MySQL Workbench
Local instance MySQL80
File Edit View Query Database Server Tools Scripting Help
Navigator
SCHEMAS
Filter objects
coursedb
hibernate
inventorydb
passport_db
Tables
Views
Stored Procedures
Functions
sys
testdb
Administration Schemas
Information
Query 1
passport_db - Schema
Limit to 1000 rows
1 CREATE DATABASE passport_db;
2 USE passport_db;
3 SHOW TABLES;
4 SELECT * FROM passport;
5 SELECT * FROM citizen;
6 SELECT c.id AS citizen_id, c.name, p.passportNumber
7 FROM citizen c
8 JOIN passport p ON c.passport_id = p.id;
9
Result Grid
Filter Rows:
Edit:
Export/Import:
Wrap Cell Content:
id name passport_id
1 Viswath 1
Result Grid
SQLAdditions
Jump to
Automatic context help is disabled. Use the toolbar t manually get help for the current caret position or t toggle automatic help.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